

CLAIMS:

What is claimed is:

1. An electrical connector for connecting a flat electrical circuit to a printed circuit board, comprising:

a dielectric housing having an opening at a front portion thereof for receiving an end of the flat circuit;

5 a plurality of terminals mounted on the housing in a side-by-side array and spaced along the opening;

an actuator movably mounted for pivotal movement at a rear portion of the housing between an open position allowing the flat circuit to be inserted into said opening and a closed position biasing at least some of the terminals against the flat circuit, the actuator having a cam portion with first and second cam surfaces;

0 some of said terminals comprising contact terminals having flexible contact arms engageable by the first cam surface of the cam portion of the actuator to bias the contact arms into engagement with the flat circuit, and tail portions for connection to appropriate circuit traces on the printed circuit board; and

5 some of said terminals comprising pivot/cam terminals having pivot means to mount the actuator for pivotal movement between said open and closed positions, and a cam surface for engaging the second cam surface of the cam portion of the actuator to provide a back-up for the cam portion as the first cam surface of the cam portion biases the flexible contact arms of the contact terminals against the flat circuit.

2. The electrical connector of claim 1 wherein said pivot means of the pivot/cam terminals comprise a pivot socket for receiving the cam portion of the actuator to pivotally mount the actuator for movement between said open and closed positions.

3. The electrical connector of claim 2 wherein said cam surface on the pivot/cam terminals is defined by one side of the pivot socket.

4. The electrical connector of claim 2 wherein said pivot socket has an open mouth to allow the cam portion of the actuator to be positioned thereinto when the actuator is assembled to the housing in its open position.

5. The electrical connector of claim 4 wherein said contact terminals have blocking portions to prevent the cam portion of the actuator from pulling out of the pivot socket when the actuator is in its closed position.

6. The electrical connector of claim 5 wherein said cam portion of the actuator has a narrow dimension in cross-section and a wide dimension generally perpendicular to the narrow dimension, whereby the narrow dimension can pass through the mouth of the pivot socket when the actuator is in its open position, and the blocking portions of the flexible contact terminals prevent the wide dimension from moving out of the mouth when the actuator is in its closed position.

7. The electrical connector of claim 1 wherein the flexible contact arms of said contact terminals engage one side of the flat circuit, and said pivot/cam terminals include generally rigid contact arms for engaging an opposite side of the flat circuit along with tail portions for connection to appropriate circuit traces on the printed circuit board.

8. The electrical connector of claim 7 wherein said pivot/cam terminals are rigidly mounted at a bottom of the housing such that the rigid contact arms are engageable with a bottom side of the flat circuit, and said contact terminals are mounted on the housing with the flexible contact arms located at a top of the housing for engaging a top side of the flat circuit.

9. An electrical connector for connecting a flat electrical circuit to a printed circuit board, comprising:

a dielectric housing having an opening at a front portion thereof for receiving an end of the flat circuit;

5 a plurality of terminals mounted on the housing in a side-by-side array and spaced along the opening, some of said terminals each having a mounting section for fixing the terminal in the

dielectric housing, a tail section projecting from one end of the mounting section outside the housing for connection to an appropriate circuit trace on the printed circuit board, a flexible contact arm projecting from an opposite end of the mounting section into said opening for engaging the flat circuit inserted into the opening, and an actuator section between the flexible contact arm and the mounting section; and

an actuator movably mounted on the housing for movement between an open position allowing the flat circuit to be inserted into said opening and a closed position in engagement with the actuator sections of the terminals to bias the flexible contact arms into engagement with the flat circuit.

10. An electrical connector for terminating a flat electrical circuit, comprising:

a dielectric housing having an opening for receiving an end of the flat circuit;

a plurality of terminals mounted on the housing in a side-by-side array and spaced along the opening;

an actuator movably mounted on the housing for movement between an open position allowing the flat circuit to be inserted into said opening and a closed position biasing at least some of the terminals against the flat circuit, the actuator having a cam portion;

some of said terminals comprising contact terminals having flexible contact arms engageable by the cam portion of the actuator to bias the contact arms into engagement with the flat circuit; and

some of said terminals comprising pivot/cam terminals having pivot means to mount the actuator for pivotal movement between said open and closed positions, and a cam surface for engaging the cam portion of the actuator to provide a back-up for the cam portion as the cam portion biases the flexible contact arms of the contact terminals against the flat circuit.

11. The electrical connector of claim 10 wherein said pivot means of the pivot/cam terminals comprise a pivot socket for receiving the cam portion of the actuator to pivotally mount the actuator for movement between said open and closed positions.

12. The electrical connector of claim 11 wherein said cam surface on the pivot/cam terminals is defined by one side of the pivot socket.

13. The electrical connector of claim 11 wherein said pivot socket has an open mouth to allow the cam portion of the actuator to be positioned thereinto when the actuator is assembled to the housing in its open position.

14. The electrical connector of claim 13 wherein said contact terminals have blocking portions to prevent the cam portion of the actuator from pulling out of the pivot socket when the actuator is in its closed position.

15. The electrical connector of claim 14 wherein said cam portion of the actuator has a narrow dimension in cross-section and a wide dimension generally perpendicular to the narrow dimension, whereby the narrow dimension can pass through the mouth of the pivot socket when the actuator is in its open position, and the blocking portions of the flexible contact terminals prevent the wide dimension from moving out of the mouth when the actuator is in its closed position.

16. The electrical connector of claim 10 wherein the flexible contact arms of said contact terminals engage one side of the flat circuit, and said pivot/cam terminals include generally rigid contact arms for engaging an opposite side of the flat circuit.

17. The electrical connector of claim 16 wherein said pivot/cam terminals are rigidly mounted at a bottom of the housing such that the rigid contact arms are engageable with a bottom side of the flat circuit, and said contact terminals are mounted on the housing with the flexible contact arms located at a top of the housing for engaging a top side of the flat circuit.

AMENDED CLAIMS

[received by the International Bureau on 29 March 2005 (29.03.05);
original claim 9 cancelled; original claims 1 and 10 amended;
remaining claims unchanged (4 pages)]

1. An electrical connector (22) for connecting a flat electrical circuit (24) to a printed circuit board, comprising:

a dielectric housing (26) having an opening (28) at a front portion (26a) thereof for receiving an end of the flat circuit;

a plurality of terminals (32,38) mounted on the housing in a side-by-side array and spaced along the opening;

an actuator (30) movably mounted for pivotal movement at a rear portion (26b) of the housing between an open position allowing the flat circuit to be inserted into said opening and a closed position biasing at least some of the terminals against the flat circuit, the actuator having a cam portion (30a) with first (30b) and second (30c) cam surfaces;

some of said terminals comprising contact terminals (32) having flexible contact arms (32c), with opposed first and second edges, the first edge engageable by the first cam surface (30b) of the cam portion (30a) of the actuator (30) to bias the second edge of the contact arms into engagement with the flat circuit, and tail portions (32b) for connection to appropriate circuit traces on the printed circuit board; and

some of said terminals comprising pivot/cam terminals (38) having pivot means (42) to mount the actuator for pivotal movement between said open and closed positions, and a cam surface (38g) for engaging the second cam surface (30c) of the cam portion of the actuator to provide a back-up for the cam portion as the first cam surface (30b) of the cam portion biases the flexible contact arms of the contact terminals against the flat circuit.

2. The electrical connector of claim 1 wherein said pivot means of the pivot/cam terminals (38) comprise a pivot socket (42) for receiving the cam portion (30a) of the actuator (30) to pivotally mount the actuator for movement between said open and closed positions.

pivot/cam terminals (38) is defined by one side of the pivot socket (42).

4. The electrical connector of claim 2 wherein said pivot socket (42) has an open mouth (42a) to allow the cam portion (30a) of the actuator (30) to be positioned thereinto when the actuator is assembled to the housing (26) in its open position.

5. The electrical connector of claim 4 wherein said contact terminals (32) have blocking portions (32f) to prevent the cam portion (30a) of the actuator (30) from pulling out of the pivot socket (42) when the actuator is in its closed position.

6. The electrical connector of claim 5 wherein said cam portion (30a) of the actuator (30) has a narrow dimension in cross-section and a wide dimension generally perpendicular to the narrow dimension, whereby the narrow dimension can pass through the mouth (42a) of the pivot socket (42) when the actuator is in its open position, and the blocking portions (32f) of the flexible contact terminals (32) prevent the wide dimension from moving out of the mouth when the actuator is in its closed position.

7. The electrical connector of claim 1 wherein the flexible contact arms (32c) of said contact terminals (32) engage one side of the flat circuit, and said pivot/cam terminals (38) include generally rigid contact arms (38b) for engaging an opposite side of the flat circuit along with tail portions (38d) for connection to appropriate circuit traces on the printed circuit board.

8. The electrical connector of claim 7 wherein said pivot/cam terminals (38) are rigidly mounted at a bottom of the housing (26) such that the rigid contact arms (38b) are engageable with a bottom side of the flat circuit, and said contact terminals (32) are mounted on the housing with the flexible contact arms (32c) located at a top of the housing for engaging a top side of the flat circuit.

10. An electrical connector (22) for terminating a flat electrical circuit (24), comprising:

a dielectric housing (26) having an opening (28) for receiving an end of the flat circuit;

a plurality of terminals (32,38) mounted on the housing in a side-by-side array and spaced along the opening;

an actuator (30) movably mounted on the housing for movement between an open position allowing the flat circuit to be inserted into said opening and a closed position biasing at least some of the terminals against the flat circuit, the actuator having a cam portion (30a);

some of said terminals comprising contact terminals (32) having flexible contact arms (32c), with opposed first and second edges, the first edge engageable by the cam portion of the actuator to bias the second edge of contact arms into engagement with the flat circuit; and

some of said terminals comprising pivot/cam terminals (38) having pivot means (42) to mount the actuator for pivotal movement between said open and closed positions, and a cam surface (38g) for engaging the cam portion of the actuator to provide a back-up for the cam portion as the cam portion biases the flexible contact arms of the contact terminals against the flat circuit.

11. The electrical connector of claim 10 wherein said pivot means of the pivot/cam terminals (38) comprise a pivot socket (42) for receiving the cam portion (30a) of the actuator (30) to pivotally mount the actuator for movement between said open and closed positions.

12. The electrical connector of claim 11 wherein said cam surface (38g) on the pivot/cam terminals (38) is defined by one side of the pivot socket (42).

13. The electrical connector of claim 11 wherein said pivot socket (42) has an open mouth (42a) to allow the cam portion (30a) of the actuator (30) to be positioned thereinto when the actuator is assembled to the housing (26) in its open position.

14. The electrical connector of claim 13 wherein said contact terminals (32) have blocking portions (32f) to prevent the cam portion (30a) of the actuator (30) from pulling out of the pivot socket (42) when the actuator is in its closed position.

15. The electrical connector of claim 14 wherein said cam portion (30a) of the actuator (30) has a narrow dimension in cross-section and a wide dimension generally perpendicular to the narrow dimension, whereby the narrow dimension can pass through the mouth (42a) of the pivot socket (42) when the actuator is in its open position, and the blocking portions (32f) of the flexible contact terminals (32) prevent the wide dimension from moving out of the mouth when the actuator is in its closed position.

16. The electrical connector of claim 10 wherein the flexible contact arms (32c) of said contact terminals (32) engage one side of the flat circuit, and said pivot/cam terminals (38) include generally rigid contact arms (38b) for engaging an opposite side of the flat circuit.

17. The electrical connector of claim 16 wherein said pivot/cam terminals (38) are rigidly mounted at a bottom of the housing (26) such that the rigid contact arms (38b) are engageable with a bottom side of the flat circuit, and said contact terminals (32) are mounted on the housing with the flexible contact arms (32c) located at a top of the housing for engaging a top side of the flat circuit.